

WHAT IS CLAIMED IS:

1 1. A method for assaying an activation state of a platelet comprising detecting
2 the catalysis of a modified prothrombinase substrate to a modified prothrombinase product by
3 a prothrombinase which is associated with the platelet.

1 2. The method of claim 1 wherein the detection of the catalysis of a modified
2 prothrombinase substrate comprises detecting the production of modified thrombin.

1 3. The method of claim 1 wherein detecting the catalysis of a modified
2 prothrombinase substrate comprises detection of modified thrombin catalytic activity.

1 4. The method of claim 1 wherein the prothrombinase enzyme comprises
2 factor Xa, factor Va and one or more members selected from the group consisting of a PS:PC
3 vesicle and a platelet.

1 5. The method of claim 1 wherein the modified prothrombinase substrate
2 comprises prothrombin which is chemically derivatized by the addition of one or more
3 chemical groups selected from the group consisting of an acyl group, an acetyl group, a
4 succinyl group, a maleyl group, a polyethylene glycol group, an acetylated polyethylene
5 glycol group, a pyridoxal 5'-phosphate group and a dichlorotriazinylaminofluoresciny group.

1 6. The method of claim 5 wherein the modified prothrombinase substrate
2 comprises prothrombin which is chemically derivatized by the addition of an acetyl group
3 wherein the acetyl group is donated by sulfo-N-succinimidyl acetate.

1 7. The method of claim 1 wherein the modified prothrombinase substrate is a
2 product of an allele of a prothrombin gene selected from the group consisting of *Metz* and
3 *Quick I*.

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1 8. The method of claim 2 wherein the detection of modified thrombin
2 comprises an assay selected from the group consisting of a Western blot, an Enzyme Linked
3 ImmunoSorbent Assay, an immunodiffusion assay, a surface plasmin resonance assay, and a
4 fluorescence proximity assay.

1 9. The method of claim 3 wherein the detection of modified thrombin
2 catalytic activity comprises detecting fibrin.

1 10. The method of claim 3 wherein the detection of modified thrombin
2 catalytic activity comprises detecting fibrinogen.

1 11. The method of claim 3 wherein the detection of modified thrombin
2 catalytic activity comprises detecting cleavage of a peptide.

1 12. The method of claim 11 wherein the peptide is glycyl-L-prolyl L-arginine
2 wherein the amino terminal end of the peptide is linked to a tosyl group and the carboxyl
3 terminal end of the peptide is linked to a p-nitroanalide group.

1 13. A kit for assaying an activation state of a platelet comprising:
2 (a) a modified prothrombinase substrate; and
3 (b) a prothrombinase product assay.

1 14. The kit according to claim 13 wherein the prothrombinase product assay is
2 selected from the group consisting of a Western blot, an Enzyme Linked ImmunoSorbent
3 Assay (ELISA), an immunodiffusion assay, a surface plasmin resonance assay, a
4 chromogenic peptide cleavage assay, a polyacrylamide gel electrophoresis analysis, and a
5 fluorescence proximity assay.

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1 15. The kit of claim 13 wherein the modified prothrombinase substrate is
2 prothrombin which is chemically derivatized by the addition of one or more chemical groups
3 selected from the group consisting of an acyl group, an acetyl group, a succinyl group, a
4 maleyl group, a polyethylene glycol group, an acetylated polyethylene glycol group, a
5 pyridoxal 5'-phosphate group and a dichlorotriazinylaminofluoresceinyl group.

1 16. The kit of claim 13 wherein the modified prothrombinase substrate is a
2 product of an allele of a prothrombin gene selected from the group consisting of *Metz* and
3 *Quick I.*

1 17. The kit of claim 13 wherein the prothrombinase product assay comprises
2 reagents for a chromogenic peptide cleavage assay wherein the reagents comprise a peptide
3 having a sequence cleaved by thrombin.

1 18. The kit of claim 17 wherein the peptide is glycyl-L-prolyl L-arginine
2 wherein the amino terminal end of the peptide is crosslinked to a tosyl group and the carboxyl
3 terminal end of the peptide is crosslinked to a p-nitroanalide group.

1 19. The kit of claim 13 further comprising one or more reagents selected from
2 the group consisting of human α -thrombin, calcium ionophore A23187, factor Xa, Sulfo-N-
3 succinimidyl acetate, factor Va and phospholipid vesicles comprising phosphatidylserine and
4 phosphatidylcholine.

1 20. The kit of claim 13 further comprising one or more components selected
2 from the group consisting of a glass vial, a microtiter plate, water and a syringe.